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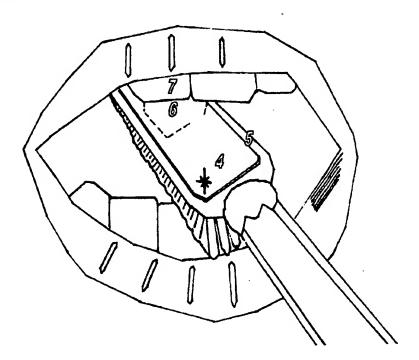
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(54) Title: TOOTHBRUSH



(57) Abstract

At least one object, typically a mirror, that has an image of the toothbrush user's teeth reflected upon it, is attached onto or imbedded into the posterior of the head of a toothbrush. A user brushing his teeth using a secondary mirror such as a bathroom mirror is able to view an image of his teeth reflected into or onto the posterior of the toothbrush head.

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TOOTHBRUSH

This invention relates to the toothbrush. In particular, the invention relates to a novel toothbrush that enables the user to clean their teeth more effectively than existing toothbrushes. Also, in comparison to existing toothbrushes, this invention will improve the user's overall oral hygiene. The invention is a toothbrush where the head portion or at least one object in or on the head portion, has an image of the toothbrush user's teeth reflected onto it. This is accomplished by primarily, but not limited to, imbedding a mirror into the posterior of the toothbrush head. When this invention is used with an additional mirror, say a bathroom mirror, it increases the user's view of their teeth especially whilst brushing them. It is this improved view during brushing that increases the user's brushing effectiveness and overall oral hygiene.

Previous research into the effectiveness of the toothbrush has lead to various topics, such as the composition, shape & flexibility of the handle, the composition, shape, length & configuration of the bristles and the shape & size of the toothbrush head, being in a number of patents. These topics have formed important criteria in evaluating and selecting a toothbrush.

Although there are alternative places to attach a mirror to a toothbrush it is by attaching it to the head, principally the posterior of the head {Fig. 2.5, Fig. 9.5}, that the user of this invention will have a maximum view of their teeth especially whilst brushing them. This invention can be used before or after brushing but it is a very important characteristic of the invention that the user is able to brush their teeth whilst simultaneously using the improved view, gained from the invention, to do so.

In order to explain table 1 and table 2, some liberties have been taken with the following terminologies that need elaborating:

1.) Our two sets of teeth {Fig. 3} are classified as:

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- a. The maxilla set {Fig. 3.8} being the set of teeth on our upper jaw.
- b. The mandible set {Fig. 3.9} being the set of teeth on our lower jaw.
- 2.) Three views of either set of teeth have been referenced:
 - a. A front view (Fig. 2.7, Fig. 3.13) being that side of our teeth facing our cheeks or lips.

- b. A rear view (Fig. 2.6, Fig. 3.14) being that side of our teeth facing our tongue (Fig. 3.11) or pallet (Fig. 3.10).
- 5 c. A top view {Fig. 3.12} being the biting, ripping & chewing part of our teeth.

Generally toothbrush users {Fig. 1.1} either brush their teeth without any view of their teeth or they use a secondary mirror, typically a bathroom mirror {Fig. 1.2} in which the reflection {Fig. 1.3} gives the users a limited view of their teeth.

10 This limited view can be broken down as follows:

Table 1: Those teeth where the user has a reasonable view:

	Tooth Set	Tooth Type	Tooth View
	Mandible	Canines	Front
15	Mandible	Canines	Тор
	Mandible	Incisors	Front
	Mandible	Incisors	Тор
	Mandible	Molars	Front
	Mandible	Molars	Тор
20	Mandible	Premolars	Front
	Mandible	Premolars	Тор
	Maxilla	Canines	Front
	Maxilla	Incisors	Front
	Maxilla	Molars	Front

Table 2: Those teeth where the user has only an obscured view or no view at all:

	Hodinst-H		Tooli View
	Mandible	Canines	Rear
	Mandible	Incisors	Rear
30	Mandible	Molars	Rear
	Mandible	Premolars	Rear
	Maxilla	Canines	Rear
	Maxilla	Canines	Тор

Table 2: Continued

	arcolli Sai	Tooth year in a	Tooti View
5	Maxill a	Incisors	Rear
	Maxilla	Incisors	Тор
	Maxilla	Molars	Rear
	Maxilla	Molars	Тор
	Maxilla	Premolars	Front
10	Maxilla	Premolars	Rear
	Maxilla	Premolars	Тор

This invention will improve the user's overall view of their teeth and more specifically improve those views that are obscured or not visible at all. The structure of our teeth differs from person to person so in some cases users may not to have a clear view of certain teeth. This invention, where possible, will improve those views as well.

An enhanced view of our teeth, whilst simultaneously brushing them, will improve the toothbrush's effectiveness as well as the user's overall oral hygiene in a number of ways, some examples being:

- 1.) Users will brush more thoroughly since they have an improved view of their teeth.
- 2.) While brushing their teeth the invention will help identify problem areas that the user needs to pay more attention to.
- It will help identify debris and food residue that might not have been previously apparent.
 - 4.) It will help identify and monitor tartar build-up, enamel breakup, tooth decay & discoloration and any problems with fillings.
 - 5.) It will assist in the early detection of potential dental diseases.

A mirror is understood to be an optical device, commonly, not solely, made from glass, with a smooth polished surface that forms images by the reflection of light. This surface or the metal within the mirror can be of a convex nature to magnify the image.

Incorporating additional lenses into the mirror can increase the degree of magnification.

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Methods of applying the invention to the head portion:

- 1.) In the preferred embodiment of the invention the mirror is imbedded into the posterior of the head of a toothbrush. The posterior is represented by the shaded in area in Fig. 4 {also, compare Fig. 4 to Fig. 12} and for the sake of clarity, described by the following:

 The head of a toothbrush has two major surfaces or sections:
 - (a) The front section {Fig. 7.16} carries the configuration of bristles {Fig. 7.17}.
 - (b) The posterior section {Fig. 4.5} is the back or rear of the toothbrush head and is opposite the front section. It can be seen to be the roof of the front section were the toothbrush in a horizontal position with the bristles facing down.
- 2.) The head portion includes any links between the head portion and the handle portion. Some toothbrushes have a neck portion that forms such a link {Fig. 4.18}. Although, in the preferred embodiment, the mirror would not be attached into or onto the neck portion it is explicitly referenced since it is, for the purposes of this invention, part of the head portion and able to carry reflective objects that would assist the user to brush their teeth.
- 3.) The head portion includes any surfaces or sections that are not the posterior or front sections. This would be any of the side sections {Fig. 5.19}. The side sections can be seen to be any section linking the front section of the toothbrush to the posterior section of the toothbrush. Although, in the preferred embodiment, the mirror would not be attached into or onto the side section it is explicitly referenced since it is, for the purposes of this invention, part of the head portion and able to carry reflective objects that would assist the user to brush their teeth.
- 4.) The top section {Fig. 6.20}, for the purposes of clarity has been separately described as being the pinnacle or roof of the toothbrush were the toothbrush in a vertical position. Although, in the preferred embodiment, the mirror would not be attached into or onto the top section it is explicitly referenced since it is, for the purposes of this invention, part of the head portion and able to carry reflective objects that would assist the user to brush their teeth.
 - 5.) Though not recommended, it is also possible to place the mirror on the front section.
 - 6.) Any combination of the above.

In the preferred embodiment of the invention an object capable of having an image of the toothbrush user's teeth reflected onto it, typically, not solely, a mirror, is embedded into the posterior of the head of the toothbrush {Fig. 2, Fig. 9}. The reflection of the user's teeth would have to be visible and identifiable to the naked eye. The mirror can be imbedded into the toothbrush in a number of ways, one example being:

The posterior of the head of the toothbrush {Fig. 10.5} is manufactured with an indentation {Fig. 10.21} in it. The mirror {Fig. 11.4} is attached into the indentation {Fig. 10.21}.

- 10 The above attachment can be achieved in a number of ways, some examples being:
 - 1.) Adhesive
 - 2.) Heat

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- 3.) One or more screws
- 4.) Any device designed to fasten, tie, link, join, couple, grip, clip, clasp, catch, hold or as male & female brackets that would fix the mirror into the toothbrush.
 - 5.) The mirror can be imbedded into or attached to a separate object, which in turn is imbedded into the toothbrush head using, for example, any of the methods listed above. The attachments serve to secure the mirror into place and since there are numerous methods of attaching the mirror to the toothbrush the above examples merely serve to illustrate the ease of doing so. The mirror could then be sealed into place so as to form a single unit {Fig. 2, Fig.9}. The sealer prevents water & other debris accumulating in or under the join.

25 per prior art {Fig. 8, Fig. 12}. An object capable of having an image of the toothbrush user's teeth reflected onto it, typically, not solely, a mirror {Fig. 11.4}, is then attached onto the posterior surface {Fig. 12.5} of the head of the toothbrush. The reflection of the user's teeth would have to be visible and identifiable to the naked eye. The method of attachment would be similar to that already described in the preferred embodiment above. Point 5 is especially significant in this scenario since the mirror would need to be encased into / with an outer sheath to protect the user from the glass & and from sharp corners.

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An alternative embodiment to either the two previous cases is where the invention would be as previously explained except that a multiple of objects capable of having an image of the toothbrush user's teeth reflected onto them {Fig. 14.4}, typically, not solely, mirrors, would be used. The reflection, in at least one object, of the user's teeth would have to be visible and identifiable to the naked eye.

An alternative embodiment of the invention is where the material that makes up the head of the toothbrush {Fig. 13.16} or at least the posterior of the toothbrush head {Fig. 13.5} is able to have an image of the users teeth {Fig. 2.6} reflected onto it {Fig. 13.4}. In other words the entire head or posterior of the head is able to carry a reflection that is visible and identifiable to the naked eye. The material could be a very reflective metal. This embodiment also includes any part of the surface of the toothbrush head. It is possible to coat the surface with a reflective paint or with a material such as tinfoil. Again, the reflection has to be visible and identifiable to the naked eye.

An alternative embodiment of the invention is where characteristics, especially the shape, of the object that is capable of having an image of the users teeth reflected onto it, is such so as to encourage children to use the invention. In Fig. 15 a mirror in the shape of a bunny {Fig. 15.4} is attached onto or imbedded into the toothbrush head. The shape of the object could typically, not solely, be an animal or cartoon character. Again, the reflection has to be visible and identifiable to the naked eye.

An alternative embodiment of the invention is the invention as previously explained in any of the above embodiments but which has the additional capability of a lighting device {Fig. 16}. The light serves to increase the quality of the reflection visible. The toothbrush would carry a simple electric circuit comprising a battery, a light {Fig. 16.23} and an on/off switch {Fig. 16.22}. The battery could be, though not limited to, the small, flat batteries found in watches, and could be placed anywhere in the toothbrush.

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The on/off switch would be placed anywhere on the toothbrush that is convenient for the user to activate it, most likely the handle. The light would be positioned anywhere on the toothbrush so as to improve the reflection of the user's teeth.

Alternatively, this light circuit could be fitted into or onto the mirror or mirror attachments. For example the object in Fig. 17 could be adapted to carry a small light circuit.

An alternative embodiment of the invention is the invention as previously explained in any of the above embodiments but where the object capable of having an image of the user's teeth reflected onto it, typically a mirror {Fig. 11.4, Fig. 17.4}, can be imbedded into or attached onto a separate object (Fig. 17.24). This second object could then be imbedded into or attached onto the head of a toothbrush. Attaching the mirror to the separate object and attaching that object to the toothbrush could incorporate the same attachment methods as discussed in the preferred embodiment. Again, the reflection has to be visible and 15 identifiable to the naked eye.

An alternative embodiment of the invention is where the object capable of having an image of the user's teeth reflected onto it, typically a mirror (Fig. 17.4) can be imbedded into or attached onto a separate object {Fig. 17.24}. This second object is manufactured or sold separate from the toothbrush and is designed to fit onto the toothbrush head {Fig. 18}, especially the posterior of the toothbrush head. Some examples of how the object would fit onto the toothbrush head:

- 1.) At least one appendage of the separate object, such as the legs in Fig. 17.25, that clasps, clamps or holds the toothbrush head.
- 2.) At least one appendage of the separate object that ties the object onto the toothbrush head.
- 3.) The male sides of the toothbrush head slides into the female tracks of the separate object. I.e. the separate object slides on top of or over the toothbrush head.
- 4.) The separate object clips onto the toothbrush head. 30 The above should not be seen to be an exhaustive list.

The above embodiments should not be seen to be mutually exclusive. The above inventions can be used in combination with each other. For example, a new toothbrush with a number of mirrors {Fig. 14} shaped as a bunnies {Fig. 15} with a light {Fig. 16} all attached to the posterior of the toothbrush head.

Fig. 1 is a toothbrush user brushing his teeth using a bathroom mirror.

The toothbrush user {Fig. 1.1} can be seen brushing his teeth, assisted by his reflection

{Fig. 1.3} in the bathroom mirror {Fig. 1.2} that would previously only provided a limited view {Table 1, Table 2} of his teeth.

Fig. 2 is a close up of the invention at work.

If the user had been using the new invention then a magnification of his reflection {Fig. 1.3} would produce Fig.2. In Fig.2 a mirror {Fig. 2.4} imbedded into the posterior of the head of the toothbrush {Fig. 2.5} shows a reflection {Fig. 2.6} of the left maxilla incisor {Fig. 2.7} in the bathroom mirror {Fig. 1.2}. This rear view of the maxilla incisor {Fig. 2.6} would not previously have been visible to the user. Note that in Fig 2 the user is brushing his teeth using the improved view of his teeth.

All 4s in this and subsequent figures are used to denote a reflective object, typically a mirror or an object carrying a mirror. The reflective object would be able to carry an image of the user's teeth that is visible and identifiable to the naked eye.

All 5s in this and subsequent figures are used to denote the posterior of the head of a toothbrush.

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Fig 3 is a dental illustration of our teeth.

It is used to explain the previous views of our teeth from a bathroom mirror, while brushing them, that are listed in table 1 and table 2. Fig. 3.8 is the maxilla set of teeth located on our upper jaw. Fig. 3.9 is the mandible set located on our lower jaw. Fig. 3.10 represents our pallet. Fig. 3.11 represents our tongue. In Fig. 3 the two points numbered as 12 represent a top view of our teeth being the biting, ripping & chewing part of our teeth. Fig. 3.13 represents a front view being that side of our teeth facing our cheeks or lips. Fig. 3.14 represents a rear view being that side of our teeth facing our tongue or palette.

Fig. 4 is used to illustrate the posterior of the head of a toothbrush. The shaded in area of Fig 4 represents the posterior {Fig. 4.5} surface or section of the toothbrush head. The majority of this shaded area is the section into which, in the preferred embodiment of the invention, the mirror would be imbedded into or attached onto {Fig 9}. Also shaded in is the neck portion {Fig. 4.18} that links the handle portion {Fig 4.15} to the head portion {Fig 4.16}. Although, in the preferred embodiment, the mirror would not be attached into or onto the neck portion it is explicitly referenced since it is, for the purposes of this invention, part of the head portion and able to carry reflective objects that would assist the user to brush their teeth.

All 15s in this and subsequent figures represents the handle of the toothbrush.

All 16s in this and subsequent figures represents the head portion of the toothbrush.

All 17s in this and subsequent figures represents the bristle configuration of the toothbrush.

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Fig 5 is a side view of a toothbrush. Fig 5 is used to explicitly include any side {Fig 5.19} of a toothbrush head as being part of the toothbrush head & being able to carry reflective objects {Fig 5.4} that would assist the user in brushing their teeth. This is not the preferred embodiment of the invention, see Fig 2 and Fig 9 for such.

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Fig 6 is a top view of a toothbrush. Fig 6 is used to explicitly include the top {Fig 6.20} of a toothbrush head as being part of the toothbrush head & being able to carry reflective objects {Fig 6.4} that would assist the user in brushing their teeth. This is not the preferred embodiment of the invention, see Fig 2 and Fig 9 for such.

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Fig. 7 and Fig. 8 are examples of existing toothbrushes. Fig 7 is the front view & Fig. 8 is a slanted posterior view. A toothbrush is understood to have at least, though not limited to, a handle portion {Fig. 7.15, Fig. 8.15} and a head portion {Fig. 7.16, Fig. 8.16} carrying a configuration of bristles {Fig. 7.17, Fig. 8.17}.

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Fig. 9 is the new state of the art. The invention has a handle portion (Fig. 9.15) and a head portion (Fig. 9.16) carrying a configuration of bristles (Fig. 9.17) and is characterised in that the posterior of the head portion (Fig. 9.5) carries an object capable of having an image of the users teeth (Fig. 2.6) reflected onto it. This object is typically, not solely, a mirror (Fig. 9.4). The transition from Fig. 8 to Fig. 9 represents the change in the state of the art.

Fig. 10 and Fig 11 represent the best method of industrialising the invention.

Fig. 10 is a slanted posterior view of the head portion {Fig. 10.16} of the toothbrush.

The posterior {Fig. 10.5} of the head of the toothbrush is manufactured with an indentation {Fig. 10.21} in it. The mirror {Fig. 11.4} is attached into the indentation {Fig. 10.21}.

Fig. 11 & Fig. 12 form an alternative method of industrialising the invention. In Fig. 12 the toothbrush is manufactured as per prior to the invention. The mirror {Fig. 11.4} is then attached onto the posterior surface {Fig. 12.5} of the head of the toothbrush.

In Fig. 13 the material that makes up the head of the toothbrush {Fig. 13.16} or at least the posterior of the head of the toothbrush {Fig. 13.5} is able to have an image of the users teeth reflected onto it {Fig. 2.6, Fig. 13.4}. In other words the entire head or posterior of the head is able to carry a reflection that is visible and identifiable to the naked eye. The material could be a very reflective metal. Alternatively, Fig. 13 could refer to any part of the surface of the toothbrush head. It is possible to coat the surface with a reflective paint or material such as tin.

Fig. 14 is used to illustrate that a multiple of objects {Fig. 14.4}, imbedded into or attached onto the toothbrush head {Fig. 14.16}, could have images of the user's teeth reflect onto them. Although not illustrated, these objects could be imbedded or attached at angles to the posterior of the toothbrush head, or at angles to each other. The angles would serve to improve the quality of reflection visible.

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Fig. 15 is used to illustrate the use of the shape of the object, capable of having an image of the users teeth reflected onto it, to encourage children to use the invention. In this case the object {Fig. 15.4} is a mirror in the shape of a bunny. The shape of the object could typically, not solely, be any animal or cartoon character.

Fig. 16 is used to illustrate the use of light to improve the quality of the reflection visible. The light {Fig. 16.23} is fitted into the posterior of the head {Fig. 16.5} of the toothbrush. An on/off switch {Fig. 16.22} is fitted into the handle of the toothbrush {Fig. 16.15}.

Fig 17 serves a dual purpose.

- 1.) It is used to show that an object capable of having an image of the user's teeth reflected onto it, typically a mirror {Fig. 17.4}, can be imbedded into or attached onto a separate object {Fig. 17.24}. This second object could then be imbedded into or attached onto the head of a toothbrush.
- 2.) It is used to show that an object capable of having an image of the user's teeth reflected onto it, typically a mirror {Fig. 17.4}, can be imbedded into or attached onto a separate object {Fig. 17.24}. This second object is manufactured or sold separate from the toothbrush and is designed to fit onto the toothbrush head {Fig. 18}, especially the posterior of the toothbrush head. The legs {Fig. 17.25} clasp or clamp the toothbrush head.
- 25 For the best mode of carrying out the invention see the description of the preferred embodiment of this invention on page 5. In short, the toothbrush is manufactured with an indentation in the posterior of the toothbrush head. A mirror is then attached into the indentation using for example adhesive. A sealer is then applied to the two objects so they form a single unit as seen in Fig. 2 and Fig. 9.

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CLAIMS

- 1. A toothbrush characterised in that the head portion or one or more objects in or on the head portion has or is adapted to have an image of the toothbrush user's teeth reflected upon it, that image being visible and identifiable to the naked eye.
 - 2. A toothbrush according to claim 1 where the head portion, especially the posterior of the head portion, has at least one mirror imbedded into it.
- 10 3. A toothbrush according to claim 1 where the head portion, especially the posterior of the head portion, has at least one mirror attached onto it.
 - 4. A toothbrush according to claim 1 where at least one of the said objects is placed at an angle to the posterior of the head portion of the toothbrush.
 - 5. A toothbrush according to any preceding claim where the shape of at least one of the said objects is such so as to encourage children using the new toothbrush.
- 6. A toothbrush according to any previous claims where the image of the toothbrush user's teeth is enhanced by at least one light imbedded into or attached onto the toothbrush.
 - 7. An object that has or is adapted to have an image of the toothbrush user's teeth reflected upon it, where the image is visible and identifiable to the naked eye, and the object is imbedded into, attaches onto or lies on top of the head of a toothbrush.
 - 8. A object according to claim 7 claim where the shape of it is such so as to encourage children to use the new toothbrush.
- 9. An object according to claim 7 where the image is enhanced by at least one light imbedded into or attached onto the object.
 - 10. An object according to claim 7 where the image is magnified.

Fig 1

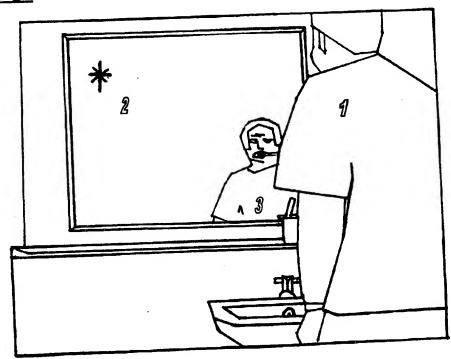


Fig 2

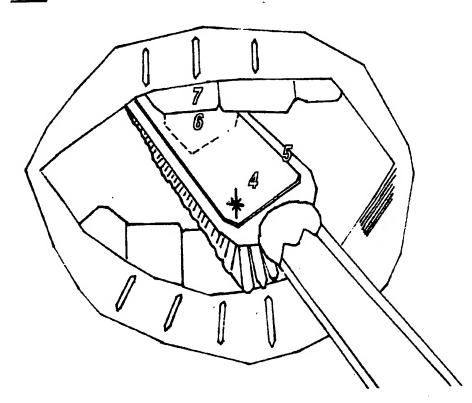


Fig 3

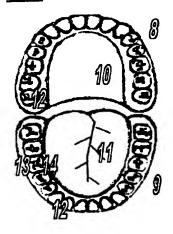
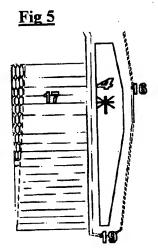
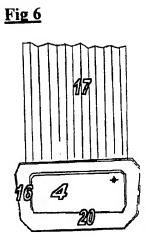


Fig 4
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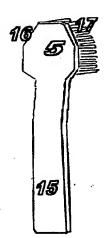




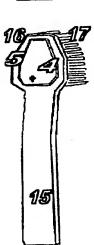
<u>Fig 7</u>

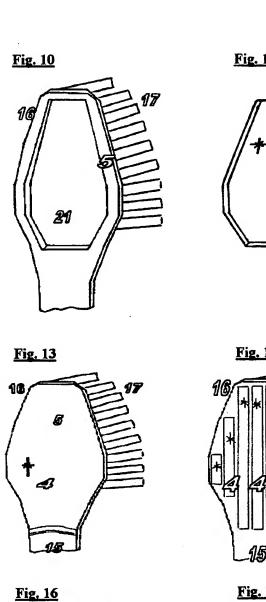


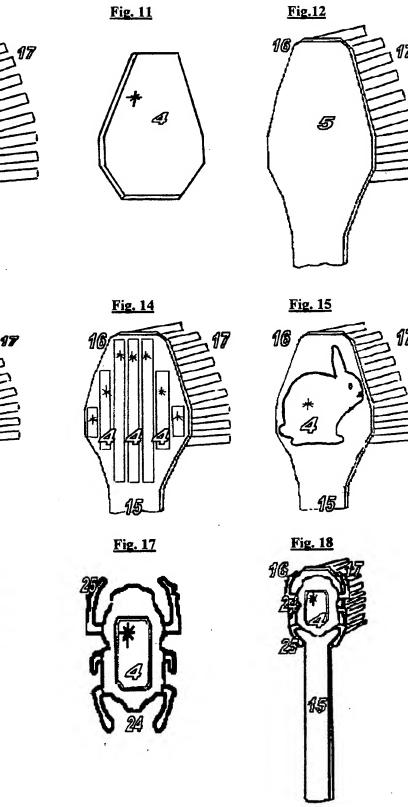


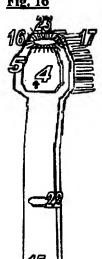


<u>Fig 9</u>









· INTERNATIONAL SEARCH REPORT

tonal Application No PCI/IB 97/01088

A. CLASSIFICATION OF SUBJECT MATTER IPC 6 A46B15/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) $IPC\ 6\ A46B\ A61H$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Х	FR 2 575 375 A (KAHN) 4 July 1986	1-4,6,7,
	see page 2, line 5 - page 5, line 31; figures 1-6	
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Date of the actual completion of theirsternational search	Date of mailing of the international search report		
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo ni, Fax: (+31-70) 340-3016	Authorized officer Triantaphillou, P		

INTERNATIONAL SEARCH REPORT

Intri ional Application No PC [/IB 97/01088

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Publication date Patent family Patent document cited in search report Publication member(s) date NONE 04-07-1986 FR 2575375 Α NONE 11-09-1957 Α FR 1141915 NONE C DE 802874 NONE Α 30-04-1953 FR 1026530 NONE 29-12-1995 Α FR 2721485 19-07-1966 NONE Α US 3261978

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TITLE: TOOTHBRUSH

PUBN-DATE: March 18, 1999

INVENTOR-INFORMATION:

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ASSIGNEE-INFORMATION:

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ABSTRACT:

At least one object, typically a mirror, that has an image of the toothbrush user's teeth reflected upon it, is attached onto or imbedded into the posterior of the head of a toothbrush. A user brushing his teeth using a secondary mirror such as a bathroom mirror is able to view an image of his teeth reflected into or onto the posterior of the toothbrush head.